WHAT IS CLAIMED IS:

1. An automated system for analyzing data obtained during manufacture of a web of paper or paperboard on a machine, comprising:

a computer including a database module, a statistical analysis module, and a processor for executing the modules;

wherein the database module contains measurements of quality parameters obtained from the web during manufacture, at least some of the measurements exhibiting periodic variations within a controllable frequency of the machine; and

wherein the statistical analysis module is capable of being executed by the processor to analyze the measurement data and estimate a target shift in at least one quality parameter that could be made if the controllable variations were removed.

2. The system of claim 1, wherein the target shift is estimated by performing Fourier analysis of the measurement data.

3. The system of claim 2, wherein the Fourier analysis involves performing Fast Fourier Transformations (FFTs).

4. The system of claim 1, wherein the statistical analysis is performed on sets of measurement data obtained during a plurality of scans of the web.

5. The system of claim 4, wherein the statistical analysis includes performing a spectral analysis on each set of data to identify long wavelength oscillations in the at least one quality parameter that exceed a desired quality specification for the parameter and are within a controllable range, and aggregating areas that are outside the desired quality specification.

1   6.   The system of claim 4, wherein the statistical analysis is
2   performed on at least one set of measurement data concurrently with
3   manufacture of the web.

1   7.   . The system of claim 6, wherein the statistical analysis is
2   performed on each set of measurement data shortly after an end of a scan
3   across a width of the web or at reel turn-up.

1   8.   The system of claim 4, wherein the statistical analysis is
2   performed on at least one set of measurement data subsequent to
3   manufacture of the web.

1   9.   The system of claim 4, wherein each set of measurement data
2   includes at least one of cross-direction measurements and machine direction
3   measurements.

1   10.   The system of claim 9, wherein each set of measurement data
2   includes both cross-direction measurements and machine direction
3   measurements.

1   11.   The system of claim 1, wherein the statistical analysis module is
2   executed by the microprocessor to transform the target shift an economic
3   value.

1   12.   The system of claim 1, further including a report module,
2   wherein the report module is capable of being executed by the processor to
3   display the target shift.

1   13.   The system of claim 12, wherein the target shift is expressed as
2   at least one of a percentage and a quantity.

1   14.   The system of claim 1, wherein the quality parameters include at
2   least one of basis weight, conditioned weight, moisture, caliper and opacity.

1   15.   The system of claim 1, wherein the quality parameters include

2   basis weight and moisture, and wherein the statistical analysis module is

3   executed by the processor to determine a first target shift based on an

4   amount that a basis weight distribution tail is above a desired basis weight

5   specification lower limit and a second target shift based on an amount that a

6   moisture distribution tail is below a desired moisture specification upper limit.

1   16.   The system of claim 1, further including a diagnostic module.

1   17.   The system of claim 16, wherein the database module contains

2   measurements of machine parameters obtained during manufacture of the

3   web, and wherein the diagnostic module is executed by the processor to

4   identify at least one of the machine parameters having periodic variations that

5   correspond to the periodic variations in the quality measurements that are

6   within the controllable range.

1   18.   The system of claim 17, wherein the diagnostic module identifies

2   the at least one machine parameter by performing a Fourier analysis on the

3   machine parameters.

1   19.   The system of claim 1, wherein the computer is a laptop sever

2   connected to a primary server by a network connection.

1   20.   The system of claim 1, wherein the computer is a central hosting

2   server connected to a primary server by a remote connection.

1   21.   The system of claim 1, wherein the computer includes a

2   communications module which can be executed by the processor to enable at

3   least one of remote access and central hosting access.

1   22.   The system of claim 1, wherein the computer includes a report
2   generating module which can be executed by the processor to provide
3   reports.

1   23.   The system of claim 22, wherein the reports can be performed
2   on subsets of measurement data that match user-defined search criteria.

1   24.   The system of claim 23, wherein the user-defined search criteria
2   includes at least one of a machine identification, a mill site identification, a
3   grade of quality, and a time of manufacture.

1   25.   The system of claim 1, wherein the target shift corresponds to a
2   percentage or amount that the at least one quality parameter is outside a
3   customer specified quality limit.

1   26.   A method for analyzing data obtained during manufacture of a
2   web of paper or paperboard on a machine using an automated system, the
3   system including a computer containing a database module, a statistical
4   analysis module, and a processor for executing the modules, the database
5   module containing measurements of quality parameters obtained from the
6   web during manufacture, the method comprising:
7   executing the statistical analysis module on the processor to
8   perform a statistical analysis of the measurement data in the database module
9   to estimate a target shift in at least one quality parameter that could be made
10   if the controllable variations were removed.

1   27.   The method of claim 26, wherein the target shift is estimated by
2   performing Fourier analysis of the measurement data.

1   28.   The method of claim 27, wherein the Fourier analysis includes
2   performing Fast Fourier Transformations (FFT).

1   29.   The method of claim 26, wherein the statistical analysis is
2   performed on sets of measurement data obtained during a plurality of scans
3   of the web.

1   30.   The method of claim 29, wherein the executing step includes
2   performing a spectral analysis on each set of data to identify long wavelength
3   oscillations in the at least one quality parameter that are outside a desired
4   quality specification for the parameter and are within a controllable range, and
5   aggregating areas that are outside the desired quality specification.

1   31.   The method of claim 29, wherein the statistical analysis is
2   performed on at least one set of measurement data concurrently with
3   manufacture of the web.

1   32.   The method of claim 29, wherein the statistical analysis is
2   performed on at least one set of measurement data subsequent to
3   manufacture of the web.

1   33.   The method of claim 29, wherein each set of measurement data
2   includes at least one of cross-direction measurements and machine direction
3   measurements.

1   34.   The method of claim 26, wherein the executing step includes
2   transforming the target shift into an economic value, and the method further
3   comprises displaying the economic value on a display.

1   35.   The method of claim 26, further including display the target
2   shift, wherein the target shift is expressed as at least one of a percentage or
3   a quantity.

-28-

1 36. The method of claim 26, wherein the quality parameters include
2 at least one of basis weight, conditioned weight, moisture, caliper and
3 opacity.

1 37. The method of claim 26, wherein the quality parameters include
2 basis weight and moisture, and wherein the executing step includes
3 determining a first target shift based on an amount that a basis weight
4 distribution tail is above a desired basis weight specification lower limit and a
5 second target shift based on an amount that a moisture distribution tail is
6 below a desired moisture specification upper limit.

1 38. The method of claim 26, wherein the database module contains
2 measurements of machine parameters obtained during manufacture of the
3 web, and the system includes a diagnostic module, the method further
4 including executing the diagnostic module on the processor to identify at least
5 one of the machine parameters having periodic variations that correspond to
6 the periodic variations in the quality measurements that are within the
7 controllable range.

1 39. The method of claim 38, wherein the diagnostic module
2 identifies the at least one machine parameter by performing a Fourier analysis
3 on the machine parameters.

1 40. The method of claim 26, wherein the computer is a laptop sever
2 connected to a primary server by a network connection.

1 41. The method of claim 26, wherein the computer is a central
2 hosting server connected to a primary server by a remote connection.

1   42.   The method of claim 26, wherein the system includes a

2 communication module, and the method further includes executing the

3 communications module on the processor to mirror data from a data historian

4 on a primary server to the database module.

1   43.   The method of claim 25, wherein the target shift corresponds to

2 a percentage or amount that the at least one quality parameter is outside a

3 customer specified quality limit.